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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/445,808	02/29/2000	ARI HOTTINEN	PM-265154	1404

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PILLSBURY WINTROP LLP  
1600 TYSONS BOULEVARD  
McLEAN, VA 22102

EXAMINER
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LEE, TIMOTHY L

ART UNIT	PAPER NUMBER
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2662

DATE MAILED: 01/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/445,808

Applicant(s)

HOTTINEN ET AL.

Examiner

Timothy Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Sugimoto et al. (US 5,579,304).
3. Regarding claim 1, Sugimoto et al. discloses a CDMA receiver that carries out certain steps when it recognizes a symbol boundary in the received baseband signal. In the first embodiment illustrated in Fig. 1, M transmitting stations, all having different spreading codes, generate radio-frequency signals and transmit them to antenna 1. The antenna 1 thus receives a CDMA signal in which the signals from all the transmitting stations are combined (received signal includes a sum signal of signals originating from several transmitters). See col. 3, lines 48-55. Each interference canceling stage generates estimated symbol values for the M stations (including generating an estimate for the received signal). Later stages refine the estimates of earlier states (the estimate includes one or more estimates of a received user signal). The final estimated symbol values t-1 to t-M are output to a decoder 9, which decodes them to reconstruct the data W1 to WM transmitted by the M stations (performing interference elimination and a simultaneous multi-user detection). See col. 4, lines 7-15. A residual symbol value is found that is an error that was made in estimating the transmitting station's symbol value in the first

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interference canceling state (whereby a narrowband, symbol level residual signal is obtained).

See col. 8, lines 1-10. It is inherent that the error is found by subtraction with the sum signal (the effect of the symbol estimated on the symbol level is subtracted from the received sum signal).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto et al. and in light of the rejection to claim 1.

6. Regarding claims 2 and 14, Sugimoto et al. discloses correlating the transmitting station's spreading code PN with signal e-1 to obtain the residual symbol value. Sugimoto et al. does not expressly disclose correlating the received signal to obtain a first symbol-level signal, then correlating the computed estimate by the same spreading code, whereby obtaining a second symbol-level signal, and then subtracting those two symbol-level values. However, it would have been mathematically equivalent and obvious to a person of ordinary skill in the art at the time of the invention to find the residual symbol value of Sugimoto et al. by performing the correlation steps before the subtraction step. One would have been motivated to do this because subtraction at the symbol-level might be easier to perform in some system set-ups.

7. Regarding claim 3, Sugimoto et al. discloses estimating the error in the estimate, so in other words, the parameters of the estimate must be estimated.

8. Regarding claims 4 and 15, it is inherent in a CDMA system that new users will be found by means of parameters. There is no other way that a receiver could find new users.
9. Regarding claims 5 and 16, it is inherent that in a CDMA system that some sort of detecting must occur to find signals, so it is must be that the system uses the estimated parameters.
10. Regarding claim 7, Sugimoto et al. discloses using the spreading code of the signals in the correlation process.
11. Regarding claim 9, Sugimoto et al. discloses estimating in a series of stages, so this is also sequentially. See at least col. 7, line 60-col. 8, line 60.
12. Regarding claim 10, Sugimoto et al. does not expressly disclose using known parameters while others are being searched, but it would have been obvious to do so. One would have been motivated to do this because it is more efficient to use information that has been attained to aid in finding more information.
13. Regarding claims 11 and 12, coherency or incoherency will depend on if the phase shifts between the signal and the estimate signal are in line or different. Sugimoto et al. does not specify which one it should be, so either one is acceptable.
14. Regarding claim 13, as mentioned previously, the estimations are performed in stages so that later estimations are more accurate than the previous ones.
15. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto et al. in view of Moshavi (Multi-user detection for DS-CDMA Communications, IEEE) and in light of the rejection to claim 1. Regarding claim 6, Sugimoto et al. does not expressly mention sending the known signals to a matched filter before the estimates can be used in the

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simultaneous multi-user detection. Moshavi discloses using a matched filter in finding the estimate values before sending the signal to be detected. See page 125.

16. Regarding claim 8, Sugimoto et al. does not expressly disclose estimating the signals in parallel, but Moshavi discloses that parallel interference cancellation is often used in receiving multiple signals. It would have been obvious to use the parallel interference cancellation method taught in Moshavi in the system disclosed by Sugimoto et al.. One would have been motivated to do this because it is superior in a non-power-controlled fading channel. See page 131 of Moshavi.

#### ***Response to Arguments***

17. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy Lee whose telephone number is (703)305-7349. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (703)305-4744. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

TLL

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A handwritten signature in black ink, appearing to read 'HASSAN KIZOU', is written over the printed name.

**HASSAN KIZOU**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**